Title of Presentation: Interactions between hatchery and naturally produced Chinook on the spawning grounds in the Greater Lake Washington Basin

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Abstract:

Chinook spawning ground surveys have been routinely conducted in Water Resource Inventory Area 8 (WRIA 8) since 1964. The purpose of these surveys is to provide an index of abundance, quantify the number of adult salmon that arrive at the spawning grounds, and provide an accurate assessment of the trends in abundance of Chinook salmon in WRIA 8. Carcass surveys are a useful addition to these data, providing information on fecundity, size at age, sex ratios, and can be used in mark-recapture studies. Beginning with the 1999 brood, almost all of the Chinook salmon raised in hatcheries throughout Puget Sound have been marked by an adipose fin clip. Subsets of these fish are marked with a unique coded wire tag (CWT) that identifies the hatchery of origin. In the autumn of 2003, hatchery produced Chinook returning to WRIA 8 as two, three, and four year olds were marked with an adipose fin clip. Of course the five-year-old Chinook were not marked, but with our aging data we will be able to predict the proportion of five-year-old fish on the spawning grounds.

In 2003 we collected data from carcasses including age, size, CWTs, adipose fin clips, sex, and spawning success of females. Of 797 carcasses sampled in WRIA 8 during 2003 surveys, 379 (48%) were adipose fin-clipped. In the Bear Creek Basin, 54% of all Chinook carcasses had clipped adipose fins. In the Cedar River tributaries it was little higher at 67%, while only 22% of those carcasses collected in the mainstem Cedar River had clipped adipose fins. Of the 12 Chinook carcasses sampled from May Creek in 2003, 58% (7) were missing adipose fins. It is not surprising that 72% of the Chinook carcasses sampled in the Issaquah Creek Basin had clipped adipose fins, because of their proximity to the Issaquah Creek Hatchery. The sex ratio of hatchery Chinook across WRIA 8 was different, with 38% of the females on the spawning grounds having an adipose fin clip, and an astounding 54% among males. This difference is not surprising, and is consistent with data from the literature.

We sampled 312 female chinook for pre-spawning mortality, and found only 28 (8.9% of the total) fish died prior to spawning. Of these fish, 15 were in the Issaquah Creek Basin (21% of total), 7 were from the Bear Creek Basin (7.2% of total), and 6 (1.8% of total) were from the Cedar River Basin. There was not a significant relationship between hatchery origin fish and pre-spawning mortality.

In the future, all age classes of Chinook produced in Washington State hatcheries will be adipose fin clipped, which will allow us to better understand the contribution of hatchery fish to natural spawning ground escapement throughout WRIA 8. In addition, insights provided by CWT recoveries will allow us to improve our understanding in regards to the spatial extent of hatchery introgression on the spawning grounds in WRIA 8.